

ENVIRONMENTAL ASSESSMENT

APPLICATION OF ESA 4(d) OPTIONS

FOR

FIVE EVOLUTIONARILY SIGNIFICANT UNITS OF WEST COAST STEELHEAD: LOWER COLUMBIA RIVER, SNAKE RIVER BASIN, CENTRAL CALIFORNIA COAST, SOUTH-CENTRAL CALIFORNIA COAST, AND CALIFORNIA CENTRAL VALLEY

National Marine Fisheries Service
National Oceanic and Atmospheric Administration

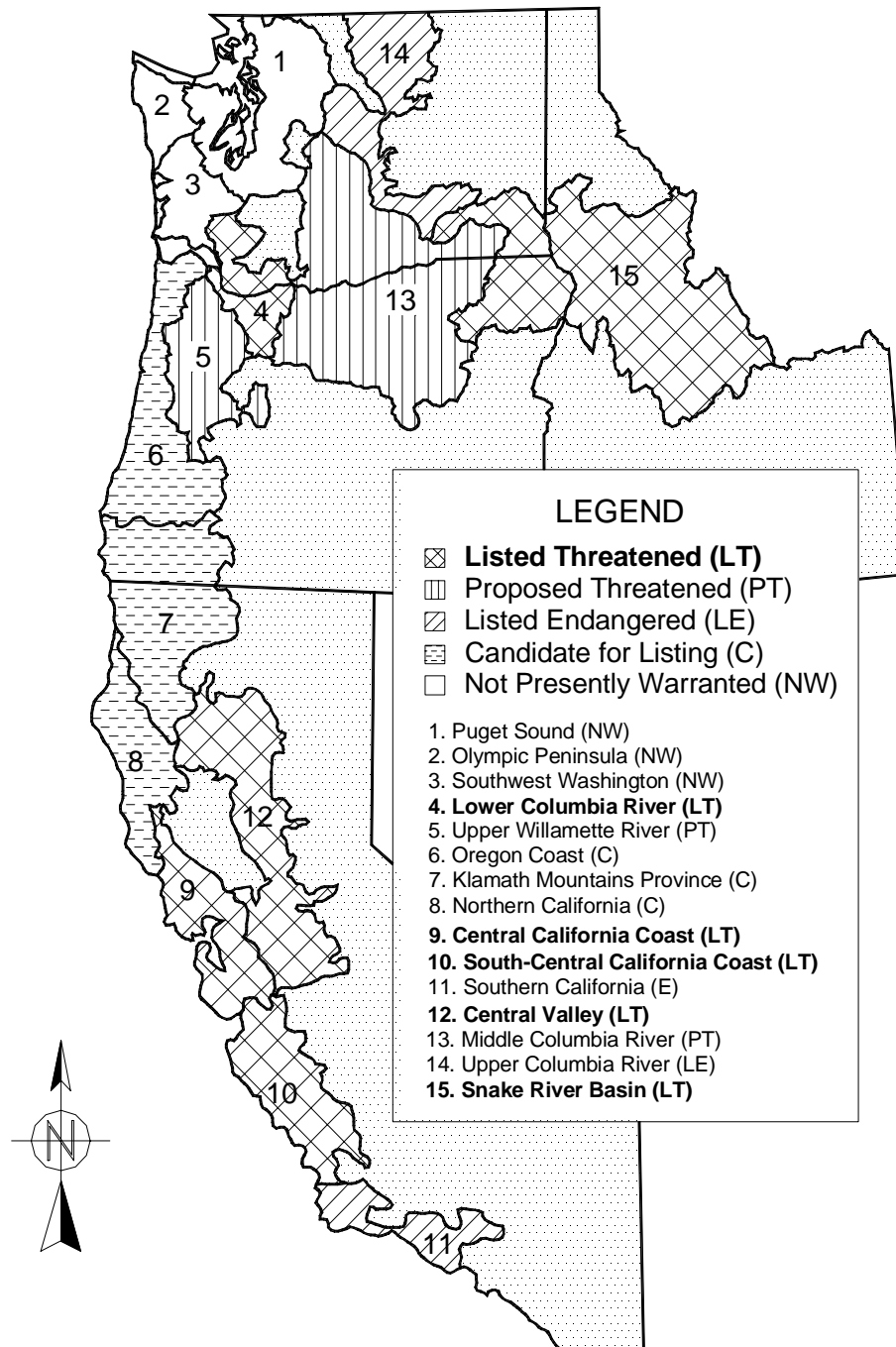
SUMMARY

Under the authority of the Endangered Species Act, the National Marine Fisheries Service is proposing to apply certain protective regulations to five Evolutionarily Significant Units (ESUs) of threatened west coast steelhead: the Lower Columbia River, Snake River Basin, Central California Coast, South/Central California Coast, and California Central Valley ESUs. This Environmental Assessment (EA) describes and evaluates five alternatives for applying take prohibitions to these ESUs. The environmental impacts of the alternative actions were assessed relative to baseline conditions established by existing laws. The results of this analysis indicate that no significant impacts on the human environment are expected to result from implementation of the preferred or potential future alternative actions, or from any combination of these alternatives.

1. PURPOSE AND NEED FOR ACTION

On August 9, 1996, the National Marine Fisheries Service (NMFS) completed a comprehensive status review of west coast steelhead (*Oncorhynchus mykiss*) populations in Washington, Oregon, Idaho and California and proposed the listing of 10 Evolutionarily Significant Units (ESUs) as threatened or endangered under the Endangered Species Act (ESA). On August 18, 1997, NMFS published a final rule listing 5 steelhead ESUs as either threatened or endangered (62 FR 43937). In that rule, the Snake River (SR), Central California Coast (CCC) and South/Central California Coast (SCCC) steelhead ESUs were listed as threatened (see Figure below). The listing decision on 5 other ESU's was postponed until 1998 (62 FR 43974). On March 19, 1998, NMFS listed the Lower Columbia River (LCR) and California Central Valley (CCV) ESUs as threatened (63 FR 13347).

Steelhead ESUs



The above-referenced documents provide background information on the biology and life history of the species and describe the decline or extirpation of the species from its historical range. The causes of decline of steelhead runs are addressed in NMFS's "Factors for Decline: A Supplement to the Notice of Determination for West Coast steelhead under the Endangered Species Act." (1996). Biological information, causes of decline, and existing conservation measures are also available from the NMFS website at www.noaa.gov.

Section 9(a) of the ESA prohibits certain activities that directly or incidentally take species that are listed as endangered. These prohibitions make it illegal for any person subject to the jurisdiction of the United States to take (take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, or collect, or to attempt any of these activities), import or export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any endangered species. The prohibitions are automatically invoked when a species is listed as endangered, but not when a species is listed as threatened. Section 4(d) of the ESA provides that whenever a species is listed as threatened, the Secretary of Commerce shall issue such regulations as are deemed necessary and advisable to provide for the conservation of the species. A 4(d) regulation could range from very minimal provisions to imposition of all of the prohibitions applicable to endangered species under Section 9(a). In crafting a 4(d) rule for the LCR, SR, CCC, SCCC, and CCV ESUs, NMFS has recognized that while many of the ongoing Federal, state and local protective efforts are likely to promote the conservation of steelhead, these efforts alone are not sufficient to achieve long-term conservation and recovery of steelhead at the scale of individual ESUs and that therefore protective regulations are necessary and advisable.

This EA describes and evaluates five alternative actions (alternative ESA section 4(d) rules) for protection of the LCR, SR, CCC, SCCC, and CCV steelhead ESUs. The environmental impacts of the alternative actions were assessed relative to baseline conditions established by existing laws. This EA was prepared in accordance with Council on Environmental Quality regulations for implementing NEPA (40 CFR Parts 1500-1508) and National Oceanographic and Atmospheric Administration environmental review procedures (Administrative Order 216-6, May 20, 1999). The lead agency for NEPA decision making is the NMFS.

The five steelhead ESUs were listed as threatened based on the specific criteria in the ESA. With that listing, section 7 of the ESA applies. Section 7 of the ESA requires federal agencies to consult with NMFS and to ensure that activities they authorize, fund or conduct are not likely to jeopardize the continued existence of a species listed as threatened or endangered. Examples of federal activities that may affect listed steelhead include operation of federal dams and hatcheries, consultation with tribes on fisheries management plans, marine fishery regulations, federal land management activities and federal licensing and permitting for such activities as silviculture, mining, road construction, dam construction, discharge of fill material, and stream channelization or

diversion. Development actions and harvest in the marine context are dealt with through section 7. Regardless of Section 4(d) regulations, federal activities may be authorized to incidentally take threatened and endangered species through a Section 7 consultation process. Federal activities that may affect threatened or endangered species can proceed as long as Section 7 consultation has been completed and such activities are done in accordance with any terms and conditions provided by NMFS in an incidental take statement accompanied by a biological opinion.

This EA addresses the added protections for the environment and for the listed ESUs that result from the take prohibitions imposed through section 4(d), over and above those that accrue from the listing action and section 7.

This EA describes five 4(d) actions being considered by NMFS. The preferred alternative applies Section 9(a) take prohibitions to most categories of activities, except for several programs or activities that provide adequate protection and conservation for the listed salmonids and for which additional federal protections are therefore not necessary and advisable. Environmental impacts are evaluated for the preferred alternative, a no action alternative, a full action alternative (all take prohibitions with no limitations), and two additional alternatives.

2. AFFECTED ENVIRONMENT

For all of the threatened west coast steelhead ESUs, only the anadromous portion of the populations are listed. Populations upstream of natural or man-made barriers are not considered part of the ESU. In most cases, hatchery stocks are not considered part of the listing unless otherwise noted.

2.1 Lower Columbia River

This coastal steelhead ESU includes tributaries to the Columbia River from the Cowlitz to the Wind River in Washington and from the Willamette to the Hood River in Oregon. Excluded are steelhead in the upper Willamette River Basin above Willamette Falls, and steelhead from the Little and Big White Salmon rivers in Washington. Steelhead in this ESU belong to the coastal genetic group and include both winter-run and summer-run fish. Hatchery populations considered part of this ESU include the late-spawning Cowlitz Trout Hatchery stock and the Clackamas River Oregon Department of Fish and Wildlife stock #122. Eastern streams in this ESU are in drier areas than their western counterparts. The tributaries draining the Cascade Mountains are more reliant on snow melt for stream flow as compared to the rain fall driven streams along the Oregon coast. Private land ownership in this ESU is approximately 56%, while Federal and state ownership make up about 38% and 6%, respectively. ("Private" land is defined as land not owned by the state and Federal governments, including city, county, and tribal land).

Major factors affecting steelhead in this ESU include genetic changes through cross-breeding with hatchery fish (introgression), habitat blockages, logging, eruption of Mount St. Helens, hydropower development, predation, and harvest of wild steelhead.

There are three other Federally listed animals and four Federally listed plants in this ESU. Bald eagle (*Haliaeetus leucocephalus*) and northern spotted owl (*Strix occidentalis caurina*) are listed as threatened and Columbian white-tailed deer (*Odocoileus virginianus*) is listed as endangered in the area encompassed by this ESU. Bradshaw's lomatium (*Lomatium bradshawii*) is listed as endangered and Nelson's sidalcea (*Sidalcea nelsoniana*), golden indian paintbrush (*Castilleja levisecta*), and howellia (*Howellia aquatilis*) are listed as threatened.

2.2 Snake River Basin

This inland steelhead ESU includes the Snake River Basin of southeast Washington, northeast Oregon and Idaho. This ESU is the most inland group of the West Coast steelhead. This inland group consists of summer steelhead (as opposed to winter steelhead found in the other ESUs). The hatchery populations considered part of this ESU include Dworshak National Fish Hatchery stock, Imnaha River stock, and Oxbow Hatchery stock. In contrast to the coastal streams, the hydrology of this inland ESU is predominately based on snow melt (rather than rain fall). The land forms in this ESU are older and more eroded than coastal steelhead habitat.

In contrast to the other ESUs, this ESU is mostly Federal lands (approximately 69%), and contains many protected National Forest Wilderness areas. Private land ownership makes up about 29% , and state land comprises 2%. The major factors for decline in this ESU include logging, agriculture, hydropower development, water diversion and extraction, hatchery introgression, habitat blockages, mining, and harvest.

There are six other Federally listed animals, including three other anadromous fishes, and four Federally listed plants in this ESU. Snake River spring/summer chinook salmon (*Oncorhynchus tshawytscha*), Snake River fall chinook salmon (*O. tshawytscha*), grizzly bear (*Ursus arctos*) and bald eagle (*Haliaeetus leucocephalus*) are listed as threatened and Snake River sockeye salmon (*O. nerka*) and American peregrine falcon (*Falco peregrinus anatum*) are listed as endangered. Bradshaw's lomatium (*Lomatium bradshawii*) is listed as an endangered plant, while Macfarlane's four-o'clock (*Mirabilis macfarlanei*) and golden indian paintbrush (*Castilleja levisecta*), howellia (*Howellia aquatilis*), and Nelson's checker-mallow (*Lindernia dubia* var *anagallidea*) are listed as threatened plants.

2.3 Central California Coast

This winter-run coastal steelhead ESU contains river basins from the Russian River,

Sonoma County, to Aptos Creek, Santa Cruz County, and the drainages of San Francisco and San Pablo Bays eastward to the Napa River, Napa County. The Big Creek and San Lorenzo River hatchery stocks are included in these ESUs. Most of the coastal drainages are dominated by vegetation consisting of redwood forest, whereas some of the tributaries to San Francisco Bay are dominated by chaparral. In addition, this area contains highly erosive ocean terrace soils. In contrast to streams north of this ESU, elevated summer stream temperatures are common, especially in the lower reaches of these streams. The coastal lagoons of these streams may play an important role in successful steelhead rearing.

Most of the land ownership in this ESU is private (approximately 92%) with little State (3%) or Federal (5%) lands. The major factors for steelhead decline in this ESU are associated with activities on private land and include water diversion and extraction, habitat blockages, agricultural activities, logging, historic flooding, hatchery introgression, poaching, mining activities, urban development or encroachment, and harvest. Problems with historic flooding have been exacerbated because of other land management practices and disturbances.

There are 21 animals in this ESU listed as Federally endangered and one additional animal proposed to be listed as endangered. There are 11 animals in this ESU listed Federally as threatened. The endangered animals include blunt-nosed leopard lizard (*Gambelia sila*), California clapper rail (*Rallus longirostris obsoletus*), California freshwater shrimp (*Syncaris pacifica*), callippe silverspot butterfly (*Speyeria callippe callippe*), California least tern (*Sterna antillarum browni* - nesting colony), conservancy fairy shrimp (*Branchinecta conservatio*), giant garter snake (*Thamnophis gigas*), Lange's metalmark butterfly (*Apodemia mormo langei*), longhorn fairy shrimp (*Branchinecta longiantenna*), lotis blue butterfly (*Lycaeides argyrognomon lotis*), mission blue butterfly (*Icaricia icarioides missionensis*), Mount Hermon June beetle (*Polyphylla barbata*), Point Arena mountain beaver (*Aplodontia rufa nigra*), salt-marsh harvest mouse (*Reithrodontomys raviventris*), San Bruno elfin butterfly (*Incisalia mossii bayensis*), San Francisco garter snake (*Thamnophis sirtalis tetrataenia*), San Joaquin kit fox (*Vulpes macrotis mutica*), Santa Cruz long-toed salamander (*Ambystoma macrodactylum croceum*), Smith's blue butterfly (*Euphilotes enoptes smithi*), tide water goby (*Eucyclogobius newberri*), and vernal pool tadpole shrimp (*Lepidurus packardii*). The one proposed endangered animal is the black legless lizard (*Anniella pulchra nigra*). The 11 animals listed as threatened include western snowy plover (*Charadrius alexandrinus nivosus* - nesting), Alameda whipsnake (*Masticophis lateralis euryxanthus*), Bay checkerspot butterfly (*Euphydryas editha bayensis*), California red-legged frog (*Rana aurora draytonii*), coho salmon (*Oncorhynchus kisutch*), delta green ground beetle (*Elaphrus viridis*), marbled murrelet (*Brachyramphus marmoratus* - nesting), northern spotted owl (*Strix occidentalis caurina*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), vernal pool fairy shrimp (*Branchinecta lynchi*), and bald eagle (*Haliaeetus leucocephalus* - nesting and wintering).

Forty-seven plants in this ESU are listed Federally as endangered and three additional plants are proposed to be listed as endangered. Five plants in this ESU are listed Federally as threatened and one is proposed threatened. The endangered plants include antioch dunes evening-primrose (*Oenothera deltooides howellii*), Ben lomond spineflower (*Chorizanthe pungens* var *hartwegiana*), Burke's goldfields (*Lasthenia burkei*), California seablite (*Suaeda californica*), Calistoga popcorn-flower (*Plagiobothrys strictus*), Clara Hunt's milk-vetch (*Astragalus clarianus*), Contra Costa goldfields (*Lasthenia conjugens*), Contra Costa wallflower (*Erysimum capitatum angustatum*), coyote ceanothus (*Ceanothus ferrisiae*), Crampton's tuctoria (*Tuctoria mucronata*), few-flowered navarretia (*Navarretia leucocephala pauciflora*), fountain thistle (*Cirsium fontinale* var. *fontinale*), Howell's spineflower (*Chorizanthe howellii*), kenwood marsh checkerbloom (*Sidalcea oregana valida*), large-flowered fiddleneck (*Amsinckia grandiflora*), Loch Lomond button-celery (*Eryngium constancei*), many-flowered navarretia (*Navarretia leucocephala plieantha*), marsh sandwort (*Arenaria paludicola*), Mcdonald's rock cress (*Arabis macdonaldiana*), Menzies's wallflower (*Erysimum menziesii menziesii*), Metcalf Canyon jewel-flower (*Streptanthus albidus albidus*), Napa blue grass (*Poa napensis*), palmate-bracted bird's-beak (*Cordylanthus palmatus*), Pennell's bird's-beak (*Cordylanthus tenuis capillaris*), pitkin marsh lily (*Lilium pardalinum pitkinense*), presidio clarkia (*Clarkia franciscana*), presidio manzanita (*Arctostaphylos hookeri ravenii*), robust spineflower (*Chorizanthe robusta* var. *robusta*), San Francisco lessingia (*Lessingia germanorum*), San Mateo thorn-mint (*Acanthomintha duttonii*), San Mateo woolly sunflower (*Eriophyllum latilobum*), sand gilia (*Gilia tenuiflora arenaria*), Santa Clara valley dudleya (*Dudleya setchellii*), Santa Cruz cypress (*Cupressus abramsiana*), Santa Cruz wallflower (*Erysimum teretifolium*), Scott's valley spineflower (*Chorizanthe robusta* var. *hartwegii*), sebastopol meadowfoam (*Limnanthes vinculans*), showy indian clover (*Trifolium amoenum*), soft bird's-beak (*Cordylanthus mollis mollis*), Sonoma alopecurus (*Alopecurus aequalis* var. *sonomensis*), Sonoma spineflower- (*Chorizanthe valida*), Sonoma sunshine (*Blennosperma bakeri*), suisun thistle (*Cirsium hydrophilum* var. *hydrophilum*), Tiburon indian paintbrush (*Castilleja affinis neglecta*), Tidestrom's lupine (*Lupinus tidestromii*), vine hill clarkia (*Clarkia imbricata*), white-rayed pentachaeta (*Pentachaeta bellidiflora*), and white sedge (*Carex albida*). The proposed endangered plants include Baker's larkspur (*Delphinium bakeri*), Hickman's cinquefoil (*Potentilla hickmanii*), and yellow larkspur (*Delphinium luteum*). The threatened species include colusa grass (*Neostapfia colusana*), encinitas baccharis (*Baccharis vanessae*), Marin western flax (*Hesperolinon congestum*), Monterey spineflower (*Chorizanthe pungens* var *pungens*), and water howellia (*Howellia aquatilis*). The proposed threatened plant is the pallid manzanita (*Arctostaphylos pallida*).

2.4 South-Central California Coast

This coastal steelhead ESU contains rivers from the Pajaro River, located in Santa Cruz County, to (but not including) the Santa Maria River, San Luis Obispo County. The Whale Rock Reservoir hatchery stock is considered part of this ESU. Most of the streams in this ESU drain the southernmost mountain range of coastal California. The dominant

upland vegetation along these streams is chaparral and coastal scrub, indicative of the drier and warmer climate compared to further north.

Land ownership in this ESU includes approximately 81% private, 18% Federal, and 1% State. The major factors for decline of steelhead in this ESU include urbanization, water diversion and extraction, historic flooding, habitat blockages, agriculture, poaching, and harvest.

There are 15 Federally listed endangered animals, one proposed endangered animal, and three threatened animals within this ESU. The endangered animals include brown pelican (*Pelecanus occidentalis californicus* - nesting), blunt-nosed leopard lizard (*Gambelia sila*), California clapper rail (*Rallus longirostris obsoletus*), California condor (*Gymnogyps californianus*), California least tern (*Sterna antillarum browni* - nesting), giant kangaroo rat (*Dipodomys ingens*), least Bell's vireo (*Vireo bellii pusillus* - nesting), longhorn fairy shrimp (*Branchinecta longiantenna*), Morro Bay kangaroo rat (*Dipodomys heermanni morroensis*), Morro shoulderband snail (*Helminthoglypta walkeriana*), San Joaquin kit fox (*Vulpes macrotis mutica*), San Cruz long-toed salamander (*Ambystoma macrodactylum croceum*), Smith's blue butterfly (*Euphilotes enoptes smithi*), and tidewater goby (*Eucyclogobius newberryi*). The one proposed endangered animal is the black legless lizard (*Gambelia sila*). The three threatened animals include Western snowy plover (*Charadrius alexandrinus nivosus* - nesting), California red-legged frog (*Rana aurora draytonii*), and vernal pool fairy shrimp (*Branchinecta lynchi*).

There are 14 Federally listed endangered plants, three proposed endangered, four threatened, and one proposed threatened plants in this ESU. The endangered plants include Beach layia (*Layia carnosa*), California jewel-flower (*Caulanthus californicus*), California seablite (*Suaeda californica*), Chorro Creek bog thistle (*Cirsium fontinale* var *obispoense*), Gambel's water cress (*Rorippa gambelii*), marsh sandwort (*Arenaria paludicola*), Menzies's wallflower (*Erysimum menziesii menziesii*), Pismo clarkia (*Clarkia speciosa immaculata*), robust spineflower (*Chorizanthe robusta* var *robusta*), salt marsh bird's-beak (*Cordylanthus maritimus maritimus*), San Joaquin woollythreads (*Lembertia congdonii*), sand gilia (*Gilia tenuiflora arenaria*), Tidestrom's lupine (*Lupinus tidestromii*), and Yadon's wallflower (*Erysimum menziesii yadonii*). The three proposed endangered plants include Mexican fannelbush (*Fremontodendron mexicanum*), Monterey clover (*Trifolium trichocalyx*), and Yadon's rein orchid (*Piperia yadonii*). The threatened plants include Hoover's eriastrum (*Eriastrum hooveri*), Monterey spineflower (*Chorizanthe pungens* var *pungens*), Morrow manzanita (*Arctostaphylos morroensis*), and San Benito evening-primrose (*Camissonia benitensis*). Gowen cypress (*Cupressus goveniana goveniana*) is the one proposed threatened plant.

2.5 California Central Valley

This coastal steelhead ESU includes the Sacramento and San Joaquin rivers and their tributaries. These rivers provide the only anadromous fish migration route to the drainages of the Sierra Nevada and Southern Cascade mountain ranges. The Central Valley is much drier than the coastal drainages. Prior to agricultural development in the rich alluvial soils of the valley, the native vegetation was dominated by oak forests and prairie grasses. Steelhead in this ESU enter the river beginning in late summer and can travel more than 300 km to spawning streams, making their migration the longest of any winter-run population. Hatchery populations included in this ESU are Coleman National Fish Hatchery stock and Feather River Hatchery stock.

The large majority of land ownership in this ESU is private (approximately 90%), while Federal and State make up small percentages of the land ownership, about 8% and 2%, respectively. Key factors affecting steelhead in this ESU include water diversion and extraction, mining, agriculture, urbanization, habitat blockages, logging, harvest, hydropower development, and hatchery introgression.

Other Federally listed animals in this ESU include 12 listed as endangered, one proposed endangered, and 13 listed as threatened. The endangered animals include blunt-nosed leopard lizard (*Gambelia sila*), California clapper rail (*Rallus longirostris obsoletus*), chinook salmon winter run (*Oncorhynchus tshawytscha*), California least tern (*Sterna antillarum browni* - nesting), Conservancy fairy shrimp (*Branchinecta conservatio*), giant kangaroo rat, Lange's metalmark butterfly (*Apodemia mormo langei*), longhorn fairy shrimp (*Branchinecta longiantenna*), salt-marsh harvest mouse (*Reithrodontomys raviventris*), San Joaquin kit fox (*Vulpes macrotis mutica*), Shasta crayfish (*Pacifastacus foris*), and vernal pool tadpole shrimp (*Lepidurus packardi*). The one proposed endangered animal is the riparian brush rabbit (*Sylvilagus bachmani riparius*). The 13 threatened animals include Western snowy plover (*Charadrius alexandrinus nivosus* - nesting), Alameda whipsnake (*Masticophis lateralis euryxanthus*), Aleutian Canada goose (*Branta canadensis leucopareia*), Bay checkerspot butterfly (*Cuphydryas editha bayensis*), California red-legged frog (*Rana aurora draytonii*), Delta green ground beetle (*Elaphrus viridis*), Giant garter snake (*Thamnophis gigas*), Lahonton cutthroat trout (*Oncorhynchus clarki henshawi*), Northern spotted owl, Paiute cutthroat trout (*O. clarki seleniris*), Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), and vernal pool fairy shrimp (*Branchinecta lynchi*).

Federally listed plants include 16 listed as endangered, one proposed endangered, 6 listed as threatened and one proposed threatened. The endangered plant include Antioch dunes evening-primrose (*Oenoghera deltoides howellii*), Butte County meadowfoam (*Limnanthes floccosa californica*), California seablite (*Suaeda californica*), Contra Costa goldfields (*Lasthenia conjugens*), Contra Costa wallflower (*Erysimum capitatus angustatum*), Crampton's tuctoria (*Tuctoria mucronata*), Greene's tuctoria (*T. greenei*), hairy orcutt grass (*Orcuttia pilosa*), Hartweg's golden sunburst (*Pseudobahia bahiifolia*), large-flowered fiddleneck (*Amsinckia grandiflora*), palmate-bracted bird's beak (*Cordylanthus palmatus*), Sacramento orcutt grass (*O. viscida*), showy indian clover

(*Trifolium amoenum*), soft bird's beak (*Cordylanthus mollis mollis*), Suisun thistle (*Cirsium hydrophilum var hydrophilum*), and Truckee barberry (*Mahonia sonnei*). The one proposed endangered plant is Chinese camp brodiaea (*Brodiaea pallida*). The six threatened plant species are Colusa grass (*Neostapfia colusana*), Hoover's spurge (*Chamaesyce hooveri*), Layne's ragwort (*Senecio layneae*), San Joaquin Valley orcutt grass (*O. inaequalis*), slender orcutt grass (*O. tenuis*), and succulent owl's-clover (*Castilleja campestris succulenta*). The one proposed threatened plant is the red hills vervain (*Verbena californica*).

3. ALTERNATIVE ACTIONS

This EA addresses the following five alternatives for applying ESA Section 4(d) to the listing of the LCR, SR, CCC, SCCC, and CCV steelhead:

- **Full Action Alternative:** application of all Section 9(a) take prohibitions with no limitations beyond Section 10 provisions.
- **Preferred Alternative:** application of Section 9(a) take prohibitions generally except with respect to Section 10 provisions and certain categories of activities that adequately protect or conserve the listed species and for which additional federal protections are therefore not necessary and advisable.
- **Alternative A:** application of the same prohibitions and Limitations on take prohibitions as described for the Preferred Alternative plus future additional limitations for actions that NMFS considers adequate to protect steelhead.
- **Alternative B:** limiting the application of Section 9(a) take prohibitions for all activities conducted in accordance with state salmon conservation plans that NMFS considers adequate to protect steelhead.
- **No Action Alternative:** no Section 9(a) take prohibitions or other protective regulations

The preferred alternative has been developed because NMFS believes that its prohibitions are those necessary and advisable to conserve and restore steelhead in the five threatened ESUs and because the future alternatives (A and B) are not feasible at this time. Alternatives A and B may be implemented by NMFS at a later date, as state or local watershed plans and regulations continue to develop. For that reason, the alternatives are explained here and are compared to the preferred action with regard to potential environmental impacts.

3.1 Full Action Alternative

The full action alternative is the implementation of all Section 9(a) prohibitions with no limitations. NMFS would have adopted this alternative if there were no categories of action governed by other entities in a manner adequate for the protection of steelhead in the threatened ESUs. NMFS considers that universal implementation of all Section 9(a) prohibitions is not necessary because of particular conservation and management efforts by other governmental entities. These conservation and management efforts include fishery management, hatchery management, research and monitoring, and habitat related activities that are all tailored toward conserving or protecting threatened steelhead and their habitat.

Section 9(a) prohibitions focus on the commerce, transport, and taking of listed species. ESA defines take broadly to include not only killing but any activity that harms a listed species or alter its habitat in a manner detrimental to the continued existence of the species. Prohibitions on take of individuals apply to direct harvest, adverse hatchery-related actions, and impacts due to disturbance of habitat. These prohibitions apply to all steelhead within the listed ESUs.

Activities that NMFS believes could potentially harm, injure or kill steelhead and result in “take” include, but are not limited to:

- Land-use activities that adversely affect steelhead habitat (e.g., logging, grazing, farming or road construction particularly when conducted in riparian areas or areas susceptible to mass wasting and surface erosion);
- Destruction or alteration of steelhead habitat, such as removal of large woody debris and "sinker logs" or riparian shade canopy, dredging, discharge of fill material, draining, ditching, diverting, blocking, or altering stream channels or surface or ground water flow (except for the habitat alteration activities that are within the limitation on take prohibitions);
- Discharges or dumping of toxic chemicals or other pollutants (e.g., sewage, oil, gasoline) into waters or riparian areas supporting the listed steelhead, particularly when done outside of a valid permit for the discharge;
- Violation of discharge permits through actions that actually impact water quality;
- Pesticide applications that adversely affect the biological requirements of the species;
- Interstate and foreign commerce of listed steelhead and import/export of listed steelhead without an ESA permit, unless the fish were harvested pursuant to this rule;

- Collecting or handling listed steelhead;
- Introduction of non-native species likely to prey on listed steelhead or displace them from their habitat;
- Water withdrawals in areas where important spawning or rearing habitats may be adversely affected.

Individuals and entities could be expected to alter proposed or ongoing activities to avoid violating the 4(d) rule. Also, Section 10 of the ESA allows parties whose activities may result in take of a listed species to obtain a take permit for scientific research or enhancement actions [Section 10(a)(1)(A)]. Section 10(a)(1)(B) permits can authorize take which is an incidental result of (rather than the purpose of) conduct of some otherwise lawful activity. If a section 10 permit is issued, the Section 9(a) take prohibitions no longer apply to the permitted action.

3.2 Preferred Alternative

At present, NMFS proposes to apply Section 9(a) prohibitions, as described above, to take of LCR, SR, CCC, SCCC and CCV steelhead, except for certain categories of activities that provide for the conservation of or are otherwise adequately protective of threatened steelhead in those ESUs.

Limitations on Take Prohibitions

The categories of activity on which NMFS finds it not necessary and advisable to impose take prohibitions include those described in the interim 4(d) rule for threatened coho (62 FR 38479, July 18, 1997) with several additions. Under specified conditions and in appropriate geographic areas, these include (1) activities conducted in accord with ESA incidental take authorization through ESA sections 7 or 10; (2) ongoing scientific research activities, for a period of six months; (3) emergency actions related to injured, stranded, or dead salmonids; (4) fishery management activities; (5) hatchery and genetic management programs; (6) scientific research activities permitted or conducted by the states; (7) state, local, and private habitat restoration activities; (8) road maintenance activities in Oregon; (9) certain park maintenance activities in the City of Portland, Oregon; (10) certain development activities within urban areas; (11) properly screened water diversion devices; and (12) forest management activities within the state of Washington. Some programs apply within both ESUs, and some to only one. A summary of each of the limitations as they apply to these two threatened steelhead ESUs is provided below.

Fishery Management Activities

State fishery management programs that are specifically implemented to minimize impacts of recreational fisheries can be developed into Fishery Management and Evaluation Plans (FMEPs). FMEPs must include measures to minimize and adequately limit take of listed steelhead, such as allowing only marked fish of hatchery origin to be retained, permitting open fishing seasons only where and when hatchery fish dominate, providing sanctuary areas for naturally-spawning steelhead, and regulating timing and size limits on resident rainbow trout fisheries to minimize incidental take of juvenile steelhead. The FMEPs also need to include monitoring of take of listed steelhead, annual coordination with NMFS on the fishing regulations, and providing NMFS with access to all data and reports related to the program. NMFS believes that a fishery program with these characteristics will adequately protect steelhead. Once an FMEP is deemed protective of steelhead by NMFS, NMFS will enter into a Memorandum of Agreement with the state to insure adequate implementation of the FMEP. Prior to finding any new or amended FMEP adequate, NMFS will make the plan available for public review and comment for a period of not less than 30 days.

Artificial Propagation Activities

As part of the fishery management activities mentioned above, hatchery steelhead are produced for recreational and tribal fisheries, usually as mitigation for lost spawning habitat upstream of impassable dams. All four states, Idaho, Washington, Oregon and California (beginning with the 1997 brood year), currently mark all hatchery steelhead by removing a fin. This allows for easy recognition of hatchery fish and is an important tool for managing naturally produced stocks. In order for their steelhead artificial propagation programs to be free of take prohibitions, a state must develop a Hatchery and Genetic Management Plan (HGMP) and assure adequate implementation through an MOA with NMFS.

Hatchery stocks can, however, be considered detrimental to the naturally spawning populations. There is considerable concern that hatchery fish have a greater degree of straying to other non-natal areas where they cross-breed with naturally occurring populations. The result can be significant loss of fitness in local populations and loss of diversity among populations and must be managed to avoid impacts to naturally produced stocks. In order to ensure that broodstock collection and associated production is appropriate, NMFS has developed criteria for evaluating HGMPs. These criteria include strict limits on collecting broodstock unless the population is functioning at or above a viable population threshold. If it is not collection would be appropriate only if the intended goal of the collection program is strictly to enhance the propagation or survival of the listed ESU, or in limited circumstances where the donor population is well above critical thresholds although not yet viable, where the collection will not appreciably slow the attainment of viable status.

An HGMP also must appropriately prioritize broodstock collection programs, demonstrate adequate existing fishery management programs and regulations, demonstrate adequate hatchery facilities, contain effective monitoring efforts, and include specific hatchery practice protocols aimed at conserving the genetic integrity of listed, naturally spawning steelhead. Some states have also prohibited planting non-native, resident rainbow trout stocks in steelhead waters and limited the overall production of steelhead.

Scientific Research and Monitoring Activities

In carrying out their fishery management responsibilities in Idaho, Washington, Oregon and California, the state fishery management agencies conduct or permit a wide range of research and monitoring studies on various fisheries, including studies on steelhead in the LCR, SR, CCC, SCCC and CCV ESUs. In general, NMFS concludes that these activities are vital for improving our understanding of the status and risks facing steelhead and will provide critical information for assessing the effectiveness of current and future management practices. Therefore NMFS does not find it necessary and advisable to prohibit take of threatened steelhead in those five ESUs when associated with scientific research and monitoring, provided that: (1) research and monitoring involving directed take of steelhead is conducted or supervised by personnel of the California Department of Fish and Game, Oregon Department of Fish and Wildlife, Washington Department of Fish and Wildlife, or the Idaho Department of Fish and Game; (2) the agencies provide NMFS with a list of all research and monitoring activities involving steelhead directed take planned for the coming year for NMFS' review and approval; (3) the agencies provide NMFS with the results of research and monitoring studies (including a report of the directed take resulting from these studies) directed at steelhead in these five ESUs; (4) the agencies provide NMFS annually with a list of all research and monitoring studies they permit that may incidentally take listed steelhead during the coming year and report the level of incidental take from the previous year's research and monitoring activities, for NMFS' review and approval; and (5) research and monitoring activities involving electrofishing in any body of water known or suspected to contain steelhead comply with "Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act" (NMFS 1998), or else requires a section 10 research permit from NMFS prior to commencing operations.

Habitat Restoration Activities

Under the preferred alternative, certain habitat restoration activities that are likely to contribute to conserving steelhead may not be subject to the take prohibitions. NMFS feels that projects based on a watershed or basin scale are likely to be the most beneficial at conserving steelhead. Incidental take of threatened steelhead that results from a habitat restoration activity would not be prohibited provided that the state has certified in writing

that the activity is part of a watershed conservation plan consistent with the watershed plan guidelines that NMFS has approved, and NMFS concurs. Until a watershed conservation plan is implemented or until two years following the effective date of a final 4(d) rule (whichever comes first), incidental take resulting from six specified categories of habitat restoration activity would not be prohibited if conducted in compliance with conditions and guidance listed in the proposed rule. If no conservation plan has been approved for a watershed after two years following the effective date of the interim rule, the general Section 9(a) take prohibitions applicable to all other habitat-affecting activities would apply to individual restoration activities.

Water Diversion Screening

A widely recognized cause of mortality among anadromous fish is operation of water diversions without adequate screening. While state laws and Federal programs have long recognized these problems and encouraged or required adequate screening of diversion ditches, structures, and pumps, large numbers of diversions are not adequately screened and remain a threat, particularly to juvenile salmonids. This proposed rule would limit the application of take prohibitions for any diversion screened in accord with NMFS' Juvenile Fish Screening Criteria, Northwest Region, Revised February 16, 1995 with Addendum of May 9, 1996, or in California with NMFS' Southwest Region "Fish Screening Criteria for Anadromous Salmonids, January 1997." The proposed limitation on take prohibitions applies only to physical impacts on listed fish due to entrainment or similar impacts of the act of diverting.

Routine Road Maintenance Activities

The Oregon Department of Transportation (ODOT), working with NMFS, has refined its routine road maintenance program to protect listed salmonids and their habitat and to minimize the impacts of road maintenance activities on receiving streams. The program governs a wide variety of maintenance activities including surface and shoulder work; ditch, bridge, and culvert maintenance; snow and ice removal; emergency maintenance; and mowing, brush control and other vegetation management. The program directs activity toward favorable weather conditions, increases attention to erosion control, prescribes appropriate equipment use, governs disposal of vegetation or sediment removed from roadsides or ditches, and includes other improved protections for listed salmonids, as well as improving habitat conditions generally. NMFS does not find it necessary and advisable to apply take prohibitions to routine road maintenance work performed consistent with the Guide, because in NMFS' judgement doing so would not increase the level of protection provided for listed steelhead. The Guide governs only routine maintenance activities of ODOT staff. Other activities, including new construction, major replacements, or activity for which a Corps of Engineers permit is required, are not covered by the routine maintenance program and therefore would remain

subject to the take prohibitions. NMFS proposes to limit the application of take prohibitions for any incidental take of steelhead that results from road maintenance activities (other than pesticide spraying and dust abatement) from the take prohibition, so long as the activity is covered by and conducted in accordance with ODOT's Maintenance of Water Quality and Habitat Guide (June, 1999).

Portland Parks Integrated Pest Management

The City of Portland, Oregon, Parks and Recreation (PP&R) has been operating and refining an integrated pest management program for 10 years, with a goal of reducing the extent of its use of herbicides and pesticides in park maintenance. The program's "decision tree" place first priority on prevention of pest (weeds, insects, disease) through policy, planning, and avoidance measures (design and plant selection). Second priority is on cultural and mechanical practices, trapping, and biological controls. Use of biological products, and finally of chemical products, is to be considered last. PP&R's overall program affects only a small proportion of the land base and waterways within Portland, and serves to minimize any impacts on listed salmonids from chemical applications associated with that specific, limited land base. NMFS believes it would contribute to conservation of listed salmonids if jurisdictions would broadly adopt a similar approach to eliminating and limiting chemical use in their parks and in other governmental functions. The PP&R has recently developed special policies to provide extra protections near waterways and wetlands, including a 25 foot buffer zone in which pesticide types are limited and application is spot applied. After careful analysis of PP&R's integrated program for pest management, NMFS concludes that it provides adequate protection for listed steelhead with respect to the limited use the program may make of the above listed chemicals. NMFS does not find it necessary and advisable to apply additional Federal protections in the form of take prohibitions to activities conducted under PP&R's integrated pest management program.

New Urban Density Development

As a general matter, significant new urban scale developments have the potential to degrade steelhead habitat and to injure or kill steelhead through a variety of impacts, but with appropriate safeguards can be specifically tailored to minimize impacts on listed steelhead to an extent that makes additional Federal protections unnecessary for conservation of the listed ESU. NMFS proposes not to apply take prohibitions to new developments governed by and conducted in accord with adequate city ordinances that help conserve anadromous salmonids. Similarly, take prohibitions would not be applied to development consistent with an Urban Reserve Plan that Metro has evaluated and approved as in compliance with adequate guidelines. Guidelines or ordinances must assure that urban reserve plans or developments will adequately address twelve issues, including appropriate siting, storm water discharge impacts to water quality, quantity, and

hydrograph characteristics, riparian buffers, avoidance of stream crossings by roads wherever possible, protecting historic stream meander patterns and wetlands, preserving flood capacity, and erosion control. Where NMFS finds ordinances or Metro guidelines adequate, imposition of take prohibitions is not necessary and advisable.

Forest Management in Washington

In the State of Washington, discussions among timber industry, tribes, state and federal agencies, and interest groups led to a February 22, 1999 Forest and Fish Report (FFR) to Governor Locke which provides important improvements in forest practice regulation. If implemented by the Washington Forest Practices Board in a form at least as protective as laid out in the FFR, these will provide a significant level of protection to listed steelhead. The FFR also mandates that all existing forest roads be inventoried for potential impacts on salmonids through culvert inadequacies, erosion, slope failures, and the like, and all needed improvements be completed within 15 years. Because of the substantial detrimental impacts of inadequately sited, constructed or maintained forest roads on salmonid habitat, this feature of the overall FFR provides a significant conservation benefit for listed ESUs in Washington. NMFS does not propose to apply section 9 take prohibitions to non-federal forest management activity conducted in the State of Washington in compliance with the FFR.

3.3 Alternative A

Alternative A is similar to the preferred action alternative, with additional limitations to the Section 9(a) take prohibitions. These additional limitations may be for state laws, regulations, and policies that NMFS believes will improve habitat conditions, adequately limit incidental take of listed, naturally-spawning steelhead, or otherwise contribute to the conservation of threatened steelhead. Such activities could include those related to water quality, water quantity, riparian zone and land management, or channel maintenance.

Several processes in the four affected states are aimed at improving habitat for salmonids, many of which involve cooperative forums. Examples of these programs include the California Fish and Game Code 5937, which requires that sufficient water be released downstream of any dam to maintain the fisheries below the dam in good condition. Oregon has combined many measures for salmonid restoration in its Oregon Plan that are aimed at protection of the riparian corridor, reduction of sedimentation from roads on state and private lands, improvement of water quality, enhancement of streamflows through enforcement of illegal water diversions and water conservation, establishment and enforcement of fill and removal laws, restoration of fish passage, installation of fish screens, and restoration of inchannel habitat structure. Washington has the Timber/Fish/Wildlife Agreement, which has the goal of protecting, restoring, and enhancing fish and wildlife habitat (including water quality). Idaho has developed the

Idaho Forest Practices Act that contains regulations that prescribe mandatory best management practices for all logging activities, including prescriptions for road construction, stream protection zones, maintenance of large organic debris and shade, and avoidance of high hazard areas. Additional examples of state laws and regulations are summarized in Steelhead Conservation Efforts, A Supplement to the Notice of Determination for West Coast Steelhead under the ESA (NMFS 1996). Alternative A reflects the possibility that one or more of these programs might be strengthened to a point where no additional federal protections are necessary and advisable, and that NMFS would therefore remove the prohibitions from activities governed by the program.

3.4 Alternative B

With Alternative B, a state would have developed a fully adequate comprehensive salmon conservation plan adequate to ameliorate all factors for decline for steelhead in an ESU. The protective measures mentioned in alternative A and others would be assembled into a comprehensive plan for each watershed, basin or other geographic unit. If such a plan was presented to NMFS, there would be no need for implementation of Section 9(a) take prohibitions, except where an activity did not follow the plan. All activities conducted in accordance with the plan would be within a limitation on the application of Section 9(a) take prohibitions and would therefore not require a Section 10 permit.

NMFS has provided guidance as to the critical elements of a salmon conservation plan. A plan must identify major factors that contributed to the steelhead decline, establish conservation/restoration action priorities, establish objectives and timelines for correcting the factors for decline, develop quantifiable criteria and standards by which progress toward objectives can be measured, and adopt actions to achieve objectives. It should address instream and upland habitat conditions, water quality and quantity, land use practices, migration barriers, and any other impediment to steelhead recovery. The plan must provide a high level of certainty that the actions will be implemented (including necessary authorizations, commitments, funding, staffing, and enforcement measures). It must also include a comprehensive monitoring and reporting program that is effective at measuring whether objectives are being met and determining whether the population is increasing or decreasing. The plan should consider other Federal, state, tribal, local, and other activities and try to incorporate those activities. Finally, the plan should use an adaptive management approach that can be used to generate needed information.

3.5 No Action Alternative

The no action alternative would reflect a decision by NMFS that no protective regulations are needed for the conservation of steelhead in the LCR, SR, CCC, SCCC, and CCV ESUs. NMFS has not proposed the no action alternative because it does not find that existing controls would provide a sufficient level of protection to steelhead.

4. ENVIRONMENTAL CONSEQUENCES

To determine the potential environmental impacts of the preferred action alternative, an impact checklist was developed. The checklist was used as a tool to assess any potentially significant impacts of the preferred alternative relative to the least protective measure (the no action alternative). The likelihood of any conservation action occurring at a particular location or time – and, thus impacts of this action on particular environmental attributes or resources – is unpredictable. However, it is expected that the four action alternatives – or any combination of these four action alternatives adopted in the 4(d) rule – would result in the same or similar outcome in terms of non-federal actions taken to conserve threatened steelhead. The primary differences would reside in the process and timing of these actions. With the Full Action Alternative, NMFS would assume greater responsibility for directly ensuring that take prohibitions are properly implemented and enforced (although development and enforcement of state conservation plans and regulations would continue). The preferred and future alternatives (A and B) reflect different scopes of adequately protective state programs which may make additional NMFS prohibitions unnecessary (although NMFS would regularly evaluate whether the programs were achieving the expected level of protection and conservation, and could at any time impose take prohibitions or other protections, as needed). However, the ultimate impact of any course of action (other than the no-action alternative) on both threatened steelhead and on the environmental features within the range of the threatened steelhead ESUs would be similar.

Regardless of which alternative is selected, it is expected that measurable changes in response to implementation of the 4(d) rule would not happen immediately – it would take some time to broaden understanding of the problems, develop corrective rules and policies that are appropriate and effective, and resolve the inevitable administrative and legal challenges. Therefore, the most reasonable scenario is that additional measures protective of threatened steelhead would be applied gradually, whether in response to the risks of ESA enforcement, or as a result of further development of state or voluntary programs to accommodate steelhead needs. Consequently, resulting actions and their environmental impacts are not expected to be significantly different in either substance or timing among the four action alternatives or any combination of these alternatives.

A summary of each of the categories (land use and planning, earth, water, air quality, transportation/circulation, noise, biological resources, energy and mineral resources, public service, utilities and service systems, aesthetics, cultural resources, and recreation) follows the checklist. Each summary addresses existing conditions and incremental impacts expected from implementation of the preferred alternative and the other alternatives. The incremental impact is determined from baseline conditions, which include all existing regulations, policies and programs that directly or indirectly contribute to the protection and restoration of steelhead and is considered the same as the

no action alternative. For example, improvements in the water quality and habitat in streams important to steelhead are required under the Clean Water Act and other regulations so implementation of the steelhead 4(d) option is expected to be insignificant or potentially result in a positive effect because of additional efforts to protect or improve water quality. In addition, any future regulation, policy, program, or plan that NMFS feels is protective of steelhead and for which NMFS limits the Section 9(a) prohibitions, will further limit the impacts of the 4(d) rule. All of the potential impacts will be due to those state or other governmental regulations, policies, programs, or plans, rather than the 4(d) rule itself.

A discussion of the potential impacts to steelhead as the result of implementation of a 4(d) option is included in the biological resources section under impact summaries. The 4(d) option selected will be designed to improve the habitat and reproductive success of steelhead populations and thus be protective of threatened steelhead. In general, the least protective option is the no action alternative, while all of the other options are intended to achieve similar results with regard to protection of steelhead. NMFS will not implement a rule with limits on application of the Section 9(a) prohibitions, unless it is confident that even with those limitations steelhead will be adequately protected.

Table 4-1. NEPA Compliance Checklist for evaluating potential negative impacts of options of protective regulations for five threatened steelhead ESUs.

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact/ Positive Effect
LAND USE AND PLANNING. Would Implementation of the 4(d) options result in:				
a) Conflict with general plan designation or zoning?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with applicable environmental plans or policies adopted by agencies with jurisdiction over the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Incompatibility with existing land use in the vicinity?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact/ Positive Effect
d) Effects on agricultural resources or operations (e.g., impacts to soils or farmlands, or impacts from incompatible land uses)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
EARTH. Would implementation of the 4(d) options result in:				
a) Unstable earth conditions or in changes in geologic substructures?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Disruptions, displacements, compaction or overcovering of the soil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Change in topography or ground surface relief features?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Any increase in wind or water erosion of soils, either on or off the site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Changes in deposition or erosion of beaches and, or changes in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean of any bay, inlet or lake?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) The destruction, covering or modification of any unique geologic or physical features.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
WATER. Would implementation of the 4(d) options result in:				
a) Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Discharge into surface waters or other alteration of surface water quality (e.g., temperature, dissolved oxygen or turbidity)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Changes in the amount of surface water in any water body?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Changes in currents, or the course of direction of water movements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Change in the quantity of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations, or through substantial loss of groundwater recharge capability?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Altered direction or rate of flow of groundwater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impacts to groundwater quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Substantial reduction in the amount of groundwater otherwise available for public water supplies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact/ Positive Effect
AIR QUALITY. Would implementation of the 4(d) options result in:				
a) Violation of any air quality standard or contribute to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
TRANSPORTATION/CIRCULATION. Would implementation of the 4(d) options result in:				
a) Increased vehicle trips or traffic congestion?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Rail, waterborne or air traffic impacts?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
NOISE. Would implementation of the 4(d) options result in:				
a) Increases in existing noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Exposure of people to severe noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
BIOLOGICAL RESOURCES. Would implementation of the 4(d) options result in:				
a) Endangered, threatened, or rare species or their habitats (including but not limited to plants, fish, insects, animals, and birds)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Locally designated species (e.g., heritage trees)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Locally designated natural communities (e.g., oak forest, coastal habitat, etc.)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Wetland habitat (e.g., marsh, riparian, and vernal pool)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Wildlife dispersal or migration corridors?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ENERGY AND MINERAL RESOURCES. Would implementation of the 4(d) options result in:				
a) Conflict with adopted energy conservation plans?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Use of non-renewable resources in a wasteful and inefficient manner?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Loss of availability of a known mineral resource that would be of future value to the region and the residents of the State?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PUBLIC SERVICES. Would implementation of the 4(d) options result in:				
a) Effect to Governmental services (including enforcement and permitting)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
UTILITIES AND SERVICE SYSTEMS. Would implementation of the 4(d) options result in a need for new systems or supplies, or substantial alterations to the following utilities:				
a) Power or natural gas?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Local or regional water treatment or distribution facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Sewer or septic tanks?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Storm water drainage?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact/ Positive Effect
e) Solid waste disposal?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Local or regional water supplies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AESTHETICS. Would implementation of the 4(d) options result in:				
a) Demonstrable negative aesthetic effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CULTURAL RESOURCES. Would implementation of the 4(d) options result in:				
a) Disturbance of paleontological resources?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Disturbance of archaeological resources?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Effects to historical resources?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) The potential to cause a physical change which would affect unique ethnic cultural values?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Restriction of existing religious or sacred uses within the potential impact area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Restriction of existing subsistence uses within the potential impact area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
RECREATION. Would implementation of the 4(d) options result in:				
a) Effects to existing recreational opportunities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

4.1 Impact Summaries

Land Use and Planning

The preferred alternative is not expected to result in significant negative impacts to or conflicts with land use and planning. Less than significant impacts could result from required changes in zoning, incompatibility with existing land use, and effects on agricultural resources. For example, if grazing, farming or development could potentially result in incidental take of steelhead or their habitat, a Section 10 permit would be required, which would require mitigation and result in a potential impact. Mitigation requirements are difficult to predict, but could range from monitoring to efforts to avoid impacts to purchasing replacement land. Because these activities can be mitigated and because there are existing state and federal laws such as the Clean Water Act that already put constraints on many of these activities, the overall impact is expected to be less than significant. The potential impacts of the future alternatives (A and B) are expected to be less than the other alternatives, because the state or other governmental regulations, policies, programs, and plans would be causing any impacts, rather than the 4(d) option. The 4(d) rule would look more like alternative B as greater state and local (grass-roots) efforts to regulate and enforce the activities that will protect steelhead and their habitat develop. With full implementation of alternative B, there would be few or no expected

impacts.

If NMFS chose to implement Section 9(a) take prohibitions without any limitations, potentially significant impacts to these activities could be expected, unless mitigated. With this alternative, all activities that have the potential to take steelhead or their habitat would require a Section 10 incidental take permit and mitigation regardless of the scale or expected level of take of the project. It is possible that some activities or projects would not be permitted. The no action alternative is expected to have the least impacts to land use and planning activities, since regulations of these activities would essentially remain unchanged as a result of that 4(d) option.

Land use and planning activities that have the potential to improve stream conditions, such as setting up stream side riparian buffer zones, will most likely improve channel structure and water quality and thus improve stream conditions for steelhead. These activities are expected to result from all of the alternatives, except the no action alternative.

Earth

Habitat restoration efforts implemented as part of the full action, preferred, and future (A and B) alternatives are expected to have positive effects on erosional characteristics in watersheds containing steelhead, and therefore would not result in significant negative impacts. Typical habitat restoration projects include activities to stabilize banks and restore natural channel processes through stream flows and land use activity changes. In addition to potential land use changes protecting riparian zones, these measures would lead to revegetation, which in turn would reduce the erosion and transport of surface soils to the stream. Such activities could improve the water quality of the streams and potentially conserve soil conditions for agricultural and other uses. In some cases, the reduction in transport of sediments may increase the life of downstream reservoirs.

Under the no action alternative, improvements in control of sedimentation and streambed conditions could occur due to conservation measures planned by state and local agencies, but would not be as a result of implementing the 4(d) option. The no action alternative is therefore not expected to result in either positive or negative impacts to geologic (earth) features or conditions.

Activities that result in reduced erosion and therefore improved insect production and spawning habitat, as well as those that improve riparian canopy closure and thus stream temperatures will benefit steelhead. These activities will most likely result from all of the 4(d) alternatives, except the no action alternative. As with land use and planning, alternative B may prove to be most efficient and perhaps effective at protecting steelhead and their habitat, because it will involve activities at all levels.

Water

Improvements in water quality and habitat in streams important to steelhead are already required by various Federal and state regulations. The preferred action alternative does not include any limitations on take prohibitions directly related to water resources. Ongoing and future state or local habitat restoration/conservation efforts could result in additional water quantity and quality regulations. If these regulations result in improved water quantity and quality conditions that NMFS believes are adequate for the conservation of listed steelhead, NMFS may implement one of the future alternatives that would limit application of the Section 9 (a) take prohibitions for activities covered under these regulations.

Implementation of state or local regulations, policies, programs, or plans for increasing water in streams to restore steelhead could have an effect on surface water quality and potentially surface and groundwater quantity. Such changes could include limits on future construction of water supply dams or expanded controls on the withdrawal of water from steelhead streams for irrigation or municipal use. If NMFS feels these regulations are adequate for the protection of steelhead, it may limit the application of take prohibitions for them as part of any future alternatives (A and B). These effects are expected to be positive or beneficial for aquatic resources including steelhead, and therefore would not result in significant impacts to water quality or quantity.

Implementation of the preferred alternative is expected to have a less than significant impact on the availability of public water supplies because it does not have any specific water quality or quantity parameters, and because other laws already exist to enforce water quality and quantity measures. Implementation of the future alternatives is also expected to result in a less than significant impact to public water supplies, because the policies governing water supplies would be implemented by the state or other governmental entity and would therefore not be a result of either of those 4(d) options. NMFS expects that the cooperative watershed planning process is the best way to avoid conflicts with human water use and water for aquatic resources and that measures can be implemented in such a way to avoid significant impacts to public water supplies while benefiting steelhead.

The full action alternative may result in potentially significant positive impacts. Projects where water supply impacts potentially result in incidental take of steelhead or their habitat would require a Section 10 permit and may require mitigation such as water conservation, purchasing alternative water supplies, monitoring, and habitat restoration. The full action alternative is expected to have a positive effect on water resources, potentially including restoring a more natural stream flow regime, increasing groundwater recharge, and improving water quality.

With the no action alternative, actions to improve water quality, groundwater, or surface water flow may still be taken by states or other governments, but the alternative itself

would not result in a significant impact. Water quality, groundwater and surface water flow could be reduced if existing laws, regulations, policies, or programs are not adequate for the conservation of water resources and therefore could result in an impact to steelhead or their habitat.

Air Quality

None of the five 4(d) alternatives is expected to significantly impact air quality. Improved habitat conservation planning may lead to reduced soil exposure around streams which could result in reduced concentrations of suspended particulate matter. Reductions in the withdrawal of water for irrigation may increase the susceptibility of surface soils to aerial transport. These changes would be more pronounced in drier regions within the five ESUs, but the changes are expected to be small, geographically isolated, and insignificant to both air quality and steelhead.

Transportation/Circulation

None of the five alternatives is expected to have significant impact on transportation or traffic patterns. Existing transportation systems (roads, rail, barge) will not be significantly impacted relative to changes that have occurred as a result of the steelhead and other listings and the subsequent implementation of the Section 7 consultation requirement for activities with Federal agency involvement.

Noise

Neither the preferred action alternative nor any of the other alternatives for these ESUs are expected to have any significant impact on noise levels.

Biological Resources

States are moving in the direction of watershed evaluation and management procedures (e.g. habitat conservation planning) for improving their aquatic and terrestrial habitats. Measures taken to improve water quality, water quantity, stream channel, riparian and watershed conditions in general will benefit steelhead as well as numerous other plant and animal populations that share habitat with steelhead. Many of the watersheds that are currently inhabited by steelhead, also contain other Federally listed animals and plants that would benefit from habitat improvements and conservation efforts implemented for steelhead. The past and recent ESA listings are expected to broaden the scope of existing plans or accelerate new plan development and implementation.

Implementation of the full, preferred, and future (A and B) alternatives is expected to have a beneficial effect on biological resources, especially steelhead. All of these 4(d) options have the explicit intent of providing for the conservation of steelhead. These options provide for minimizing direct or indirect take of steelhead and/or will include implementation of actions that improve existing habitat conditions for steelhead including, but not limited to, improving water quality and quantity, minimizing impacts from hatchery operations, removing passage barriers, reducing watershed erosion, and restoring riparian vegetation. These options would therefore not result in significant negative impacts to biological resources.

Under the no action alternative, states may still implement protective measures for steelhead, but those beneficial effects would not be as a result of the 4(d) rule. However, this alternative does not require implementation of protective actions. Steelhead would suffer from the lack of any protection. Activities that could potentially take steelhead would not be prohibited by NMFS.

Energy and Mineral Resources

Neither the preferred 4(d) alternative nor the other alternatives are expected to have a measurable effect or significant impact on energy resources in the five steelhead ESUs. If the action leads to additional restrictions on mining or extraction of other energy resources, it is expected that this would result in improved conservation actions, benefiting the environment as a whole and would not significantly impact the availability of these resources for human use.

The proposed actions could lead to restrictions on the future development of hydroelectric facilities, which may necessitate use of other fuels or other means for generating electricity. However, because these facilities are subject to licensing by the Federal Regulatory Energy Commission, they would involve a Federal agency and therefore be subject to Section 7 and not impacted by the preferred action alternative or any of the other 4(d) alternatives.

Gravel mining from streambeds may be further curtailed or eliminated in some areas. This may reduce the supply of concrete and other sand and gravel construction materials, but the impact is expected to be minor since other sources of gravel are available from outside (and potentially within) the area encompassed by these five ESUs. In addition, certain additional restrictions may be applied to operating permits to control runoff from spoils piles, resulting in improved soil and water quality.

Public Services

Implementation of the full, preferred, and future alternatives could result in increased

local or state permitting or enforcement requirements. The impact is expected to be less than significant, because the necessary permitting and enforcement agencies are already in place in all four states and the change in workload is expected to be minimal.

Utilities and Service Systems

The preferred 4(d) alternative, the future alternatives (A and B), or the full action alternative are expected to have less than significant impacts on utilities and service systems. Existing laws and regulations currently involve specific requirements for water treatment, sewer and septic tanks, storm water drainage, and solid waste disposal. There is no expected significant change in power generation or public water supplies. There would be no impacts from implementation of the no action alternative, which would not require any changes from the existing conditions.

Aesthetics

Implementation of the full, preferred, or future alternatives (A and B) is expected to have positive effects on aesthetics of the environment because of reduced erosion in individual watersheds. Implementation of the no action alternative would not provide those positive benefits.

Cultural Resources

Long-term positive effects are expected for cultural resources with the implementation of any of the alternatives when compared to the no action alternative. Similar to biological resources, the fisheries related to cultural resources will be protected for future use and reduction of erosion could protect cultural resource sites. In the short-term, there could be impacts related to reductions in steelhead and associated salmon harvest which uses mixed stock/species methods (e.g. gill nets). This could have an effect on subsistence uses of these species. Since NMFS expects to work with the Native American tribes that fish in the area to protect their Federally reserved fishing right, no significant impact is expected overall. Recovery of steelhead populations will improve opportunities for ceremonial and subsistence fisheries in the future.

Implementation of the no action alternative could impact cultural resources, because of inadequate protection of fishery resources and cultural sites with the reliance on existing state and tribal laws, regulations, policies, and programs.

Recreation

Implementation of the preferred 4(d) alternative or either of the future alternatives (A and B) is not expected to have a significant impact on recreational opportunities. Most impacts on recreational fisheries are a result of the decline in numbers of fish. Fishery and hatchery management plans developed by each of the states will aid in maintaining existing recreational fisheries targeted on non-listed, hatchery steelhead. Changes in fishing seasons or locations is expected to be minimal and therefore insignificant. As with the tribal fisheries, opportunities are expected to increase as steelhead reach recovery, so in the long-term recreation could see a positive effect. Implementation of the full action alternative could, in this case, result in a less than significant impact to recreational fishing opportunities, because targeted and incidental take would not be allowed without a Section 10 permit. Implementation of the no action alternative could have a greater long-term impact on recreation, because no action would allow continued impacts on populations that might otherwise rebuild to provide a stronger recreational fishery.

Economic Impacts

An Initial Regulatory Flexibility Analysis (September, 1999) referenced in the proposed rule describes with as much detail as is feasible the economic impacts associated with alternative 4(d) approaches.

5. COMPARISON OF THE ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVES

NMFS believes that implementation of the no action alternative would likely not provide adequate protection of steelhead and their habitat. While there are existing mechanisms at the state and local levels to protect steelhead, in most cases, the impetus for these measures has been the recent listings of pacific salmonids and they do not yet generally provide adequate steelhead protection. Further, if there were no take prohibitions implemented by NMFS, many of these cooperative efforts may take longer to be initiated or may not be initiated at all because of lack of funding or other resources. For this reason, it is expected that the no action alternative could result in impacts to steelhead greater than those expected to occur from the preferred alternative and is not likely to be implemented by NMFS.

Likewise, the full action alternative, which may seem more protective of steelhead and other environmental resources, is not expected to be implemented by NMFS. Implementation of all Section 9(a) take prohibitions protects the resource from many future potential impacts, because of the required Section 10 incidental take process, but it may not protect the resource as effectively and quickly as cooperative efforts that address ongoing activities. Even though a Section 10 permit is required for existing projects and ongoing operations, it is often the case with a new listing that many of these continue for years without one. Discussions may only be triggered when a permit is required because

of a change in operations and could take many years to be initiated. In addition, the Section 10 process does not often allow watershed wide impacts to be addressed (except when Habitat Conservation Plans are developed), but focuses only on independent project impacts that may or may not lead to the recovery of steelhead. As compared to the no action alternative, the full action alternative would be an improvement over status quo and result in less than significant environmental impacts.

NMFS believes that cooperative conservation efforts with state and local governments will best protect steelhead resources in the five threatened ESUs. The type of grass-roots efforts currently being implemented and initiated will foster public education and result in watershed restoration and conservation that will better address steelhead needs. The preferred alternative will not result in environmentally significant negative impacts, but NMFS would like to see additional cooperative efforts with the ultimate long-term goal being implementation of alternative B. Implementation of either alternative A or B, when and if warranted, would represent even more gains in protection and conservation for threatened steelhead.

6. FINDING

NMFS finds that implementation of the preferred alternative or future alternatives (A and B) for implementation of the 4(d) options will not have a significant effect on the environment and that long-term positive environmental effects are expected from these actions. Implementation of the full action alternative has the potential to have a few significant positive impacts. While implementation of the no action alternative has little impact on the elements of the environment reviewed, it does have some potential to have impacts to steelhead and other similar or linked resources greater than those expected to occur from the preferred alternative.

Finding of No Significant Impact

For the reasons discussed in this Environmental Assessment, NMFS believes that approval and implementation of the final rulemaking governing implementation of 4(d) regulations to provide for the conservation of the steelhead in the five ESUs reviewed in this EA, or the alternatives to that action, would not significantly affect the quality of the human environment.

The anticipated impacts to the population under this action would be negligible. Based upon that finding, the preparation of an Environmental Impact Statement is not required by Section 102(2) of the National Environmental Policy Act or its implementing regulations.

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7. REFERENCES

- Federal Register (62 FR 38479), 1997. Endangered and Threatened Species: Interim Rule Governing Take of the Threatened Southern Oregon/Northern California Coast Evolutionarily Significant Unit (ESU) of Coho Salmon. July 18, 1997.
- Federal Register (62 FR 43937), 1997. Endangered and Threatened Species: Listing of Several Evolutionarily Significant Units (ESUs) of West Coast Steelhead.
- Federal Register (63 FR 13347), 1998. Endangered and Threatened Species: Threatened Status for Two ESUs of Steelhead in Washington, Oregon, and California. March 19, 1998.
- FEMAT, 1993. Forest Ecosystem Management: An Ecological, Economic and Social Assessment. Report of the Forest Ecosystem Management Assessment Team. US Government Printing Office 1993-793-071. Portland, Oregon.
- Garcia, T., 1997. Innovative Application of the Endangered Species Act. National Oceanic and Atmospheric Administration. August 11, 1997.
- Idaho Department of Lands, 1996. Forest Stewardship Guidelines for Water Quality. Best management practices. Coeur d'Alene, Idaho.
- McEwan, D. and T.A. Jackson. 1996. Steelhead Restoration and Management Plan for California.
- NMFS, 1996a. Factors for Decline: A supplement to the notice of determination for west coast steelhead under the Endangered Species Act. (Available from Protected Resources Division, NMFS, 525 N.E. Oregon St., Portland, OR 97232)
- NMFS, 1996b. Steelhead Conservation Efforts: A supplement to the notice of determination for west coast steelhead under the Endangered Species Act. (Available from Protected Resources Division, NMFS, 525 N.E. Oregon St., Portland, OR 97232)
- NMFS, 1998. Draft Proposal on Oregon Forest Practices. Portland, Oregon.
- National Research Council, 1996. Upstream – Salmon and Society in the Pacific Northwest. National Academy Press, Washington, D.C.
- Northwest Indian Fisheries Commission, 1995. Salmon and Steelhead Habitat Inventory and Assessment Project. Wild Salmon Stock Restoration Initiative, Olympia, WA.
- Oregon Department of Forestry, 1997. Forest Practices Monitoring Programs. Riparian Inventory Field Guide. Salem, Oregon.
- Oregon Department of Forestry, 1997. Southwest Oregon State Forest Management Plan. Salem, Oregon.
- Poff, N.L., 1997. Trout Unlimited's North America Salmonid Policy: Science-Based Guidance for 21st Century Coldwater Conservation. Trout Unlimited, Arlington, VA.
- Shropshire, L. 1997. Characterization of Ongoing Watershed-Scale Conservation Efforts Within Four Proposed Steelhead Evolutionarily Significant Units (ESU) in California. NMFS - Southwest Regional Office. (Available from Protected Resources Division, NMFS, 525 N.E. Oregon St., Portland, OR 97232)
- Spence, B.C., G.A. Lomnický, R.M. Hughes, and R.P. Novitzki, 1996. An Ecosystem Approach to Salmonid Conservation. RT-4501-96-6057. ManTech Environmental

Research Services Corp., Corvallis, OR
State of Oregon, 1997. Oregon Coastal Salmon Restoration Initiative.
State of Oregon and National Marine Fisheries Service, 1997. Memorandum of Agreement [on the OCSRI]. April 1997.
Washington Department of Fish and Wildlife, 1997. Wild Salmonid Policy (Draft).